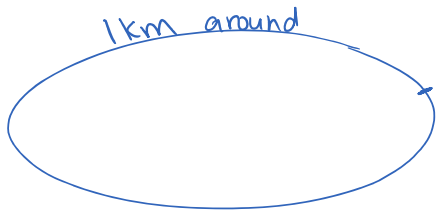


1.1 Scalars and Vectors

September 8, 2017 11:00 AM

Scalars - have no direction, only have magnitude
- volume, mass, length/distance, speed, energy

vectors - have direction and magnitude
- displacement, velocity, acceleration, force, momentum
- symbol is "bolded" or has an arrow on top " \vec{F} "



once around:

distance = 1 km

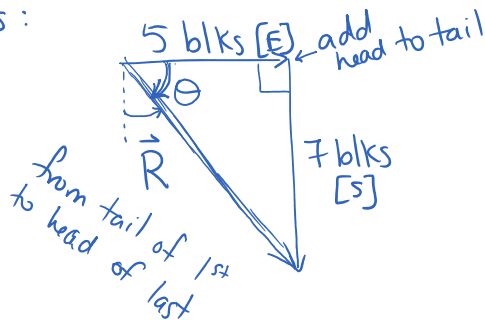
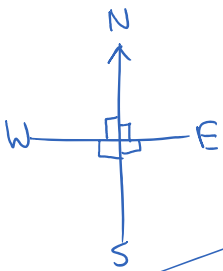
displacement = 0 km
= change in position

Vector addition:

1 - dimension:

$$\begin{aligned} & \begin{array}{c} \uparrow \\ 2 \text{ blocks} \\ [N] \end{array} + \begin{array}{c} \downarrow \\ 3 \text{ blks} \\ [S] \end{array} = \begin{array}{c} \downarrow \\ 1 \text{ block} \\ [S] \end{array} \\ \text{or} \quad & -2 \text{ blks} [S] + 3 \text{ blks} [S] = 1 \text{ blk} [S] \end{aligned}$$

2 - dimensions:



pythagoras

$$\begin{aligned} \vec{R}^2 &= 5^2 + 7^2 \\ \vec{R} &= \sqrt{5^2 + 7^2} \\ &= \sqrt{74} \\ &= \underbrace{8.6 \text{ blocks}}_{\text{magnitude}} \end{aligned}$$

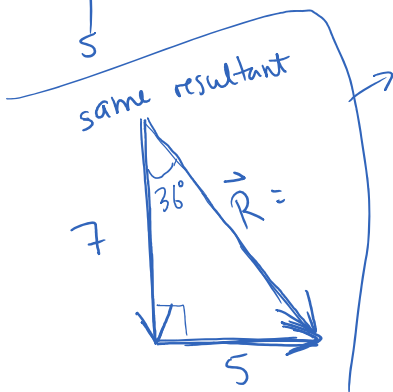
$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$\theta = \tan^{-1}\left(\frac{7}{5}\right) = 54^\circ \text{ angle}$$

$$\vec{R} = 8.6 \text{ blocks } [54^\circ \text{ S of E}]$$

or

$$8.6 \text{ blocks } [36^\circ \text{ E of S}]$$



pg 6 #2-4

Ans: 2. no diff

3. $260\text{m} [23^\circ \text{E of N}] = 260\text{m} [67^\circ \text{N of E}]$

4a) 5 steps $[53^\circ \text{S of E}] = 5 \text{ steps} [37^\circ \text{E of S}]$

b) 17 steps